

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of)	
)	
Petition for Waiver to Allow Deployment of)	GN Docket No. 18-357
Intelligent Transportation System Cellular)	
Vehicle to Everything (C-V2X) Technology)	

To: Chief, Office of Engineering and Technology
Chief, Wireless Telecommunications Bureau

**COMMENTS IN OPPOSITION OF

THE OPEN TECHNOLOGY INSTITUTE AT NEW AMERICA,
AMERICAN LIBRARY ASSOCIATION, BENTON FOUNDATION,
CONSUMER FEDERATION OF AMERICA,
PUBLIC KNOWLEDGE AND X-LAB**

Michael Calabrese
Amir Nasr
Wireless Future Project
Open Technology Institute at New America
740 15th Street NW, Suite 900
Washington, D.C. 20005

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The Open Technology Institute at New America, American Library Association, Benton Foundation, Consumer Federation of America, Public Knowledge, and X-Lab (“Public Interest Organizations” or “PIOs”) hereby submits comments opposing the 5GAA Petition for Waiver (“5GAA Petition”) in which the 5G – Automotive Association (“5GAA”) requests permanent, nationwide, and exclusive use of 20 megahertz of spectrum in the upper portion of the 5850-5925 MHz band (“5.9 GHz band”).¹

I. Summary and Introduction

5GAA’s “Petition for Waiver” is in reality a request to open a new 5.9 GHz rulemaking that would substantially overlap and undermine the Commission’s pending 5.9 GHz rulemaking. The Commission already has an ongoing, multi-stage rulemaking that is specifically aimed at reconsidering the allocation and potential uses of the entire 75 megahertz ITS band. That

¹ *Public Notice*, “Office of Engineering and Technology and Wireless Telecommunications Bureau Seek Comment on 5GAA Petition for Waiver to Allow Deployment of Cellular Vehicle-to-Everything (C-V2X) Technology in the 5.9 GHz Band,” DA 18-1231 (rel. Dec. 6, 2018).

rulemaking is into its sixth year and is expressly considering options that are directly contradictory to carving out a portion of the band for the exclusive use of yet another command-and-control technology that has not even been adopted by the Department of Transportation. 5GAA is using the procedurally inapt contrivance of a “waiver” to circumvent a fresh look at the highest and best use of the entire 5.9 GHz band through a broader and more appropriate Further Notice of Proposed Rulemaking.

One option still explicitly under consideration would segment the band, moving ITS real-time safety signaling (V2X) into an exclusive assignment at the top of the band (e.g., 20 or 30 megahertz, as in Europe). By proposing that the top 20 megahertz be set aside *exclusively* for one particular ITS standard (C-V2X), 5GAA effectively seeks to hijack what is probably at this time the most plausible outcome of the pending *5.9 GHz NPRM*. The Petition also contradicts what 5GAA has proposed for Europe, with both technologies coexisting on just 30 megahertz. The Public Interest Organizations strongly support the NCTA and WISPA requests for an immediate FNPRM to consider what allocation of the 5.9 GHz band best serves the public interest going forward.

Even putting aside the petition’s procedural defects, the technology is at such an early stage that an experimental license or other temporary authorization that facilitates real-world field testing could meet 5GAA’s needs during the period the FCC needs to issue a FNPRM and decide on a complete, coherent realignment of the ITS band. The public interest will not benefit from a narrow, near-term decision that this particular 20 megahertz is the prize in a beauty contest and should be awarded exclusively to the C-V2X faction of the auto industry without a broader consideration of alternative technologies (e.g., DSRC, automated vehicle and driver-

assist), alternative uses (e.g., unlicensed sharing), and alternative bands for V2X that are potentially *more* useful for a system that is an application integrated with 5G mobile networks.

Commission spectrum policy has evolved over the past two decades in a direction that is distinctly incompatible with 5GAA's proposal. The Commission should continue to move away from silos of special-purpose spectrum bands and toward more intensively-used and flexible general-purpose use of spectrum. C-V2X has a perfect opportunity to prevail in the market as an application on general purpose mobile 5G networks. But even if the Commission decides that a spectrum set-aside for time-critical safety signaling is justified, the band segmentation approach that has been before the agency for three years at least minimizes the cost of another DSRC-type failure. As the Commission has stated multiple times in policy statements since the 2002 Spectrum Policy Task Force Report, exceptions made for public safety or other public interest allocations should be narrowly defined ***“and the amount of spectrum . . . limited to that which ensures that those [compelling public interest] objectives are achieved.”***

As Commissioner O'Rielly so aptly put it, the 5.9 GHz band is “the missing link between the 5 GHz and 6 GHz bands.” The 5.9 GHz band is underused and is perfectly situated to fuel the next generation of gigabit-fast Wi-Fi as a complementary pillar of a robust 5G wireless ecosystem. During the two decades the 5.9 GHz has sat unused, the U.S economy's reliance on unlicensed technologies such as Wi-Fi has soared. Wi-Fi yields hundreds of billions of dollars annually for U.S. consumers and the economy more broadly. As the European Union has already determined, only up to 30 megahertz is necessary for time-critical road safety. The record in the ongoing 5.9 GHz proceeding shows that the lion's share of the 5.9 GHz band can be shared between multiple technologies – and certainly should be for commercial and non-real-time, safety-related applications.

The 5GAA's proposal should be subsumed in a broader FNPRM that takes a fresh look at what spectrum is best suited for V2X safety signaling – and what spectrum for unlicensed and next generation Wi-Fi – in the decades ahead. As consumer advocates, our groups believe the Commission can optimize the public interest benefits of both allocations. 5GAA's petition is welcome as well in the sense that it confirms the end of the proposed DSRC mandate. The exclusive set-aside of prime spectrum for a specific, unproven technology has proven to be an unwise and wasteful remnant of command-and-control spectrum policy. Our organizations urge the Commission to take a step back and reexamine the 5.9 GHz band in a holistic, forward-looking fashion through the process of a band-wide FNPRM that considers all options.

II. 5GAA's Waiver Petition Should be Denied and its Proposal Considered as Part of a Further Notice in the Commission's Ongoing 5.9 GHz Rulemaking

5GAA's "Petition for Waiver" is in reality a request to open a new 5.9 GHz rulemaking that would substantially overlap and undermine the Commission's pending 5.9 GHz rulemaking. The Commission already has an ongoing, multi-stage rulemaking that is specifically aimed at reconsidering the allocation and potential uses of the entire 75 megahertz ITS band.² That rulemaking is into its sixth year and is expressly considering options that are directly contradictory to carving out a portion of the band for the exclusive use of yet another command-and-control technology that has not even been adopted by the Department of Transportation. 5GAA is using the procedurally inapt contrivance of a "waiver" to circumvent a fresh look at the highest and best use of the entire 5.9 GHz band through a broader and more appropriate Further Notice of Proposed Rulemaking.

² See Notice of Proposed Rulemaking, *Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, ET Docket No. 13-49 (rel. Feb. 20, 2013) ("5.9 GHz NPRM").

The issue already pending before the Commission in ET Docket No. 13-49 is whether Intelligent Transportation Services (currently just DSRC) can share all or a portion of the 5.9 GHz band with low-power unlicensed services, particularly Wi-Fi. One option still explicitly under consideration would segment the band, moving ITS real-time safety signaling (V2X) into an exclusive assignment at the top of the band (e.g., 20 or 30 megahertz, as in Europe). 5GAA, by proposing that the top 20 megahertz be set aside exclusively for one particular ITS standard (C-V2X), effectively seeks to hijack what is probably at this time the most plausible outcome of the pending 5.9 GHz NPRM.

The 5.9 GHz proceeding is by no means complete or stagnant. The Office of Engineering and Technology (“OET”) released a public notice in June, 2016, describing a three-phase test plan to determine the extent to which unlicensed devices could share the 5.9 GHz band with DSRC systems.³ In October, just three months ago, OET requested comment on its Phase I testing report.⁴ The Commission has also recently received *ex parte* requests from two associations representing cable and rural Internet service providers requesting that the Commission issue a Further Notice of Proposed Rulemaking (FNPRM) seeking comment on whether to “designate all or a substantial portion of the 5.9 GHz band for unlicensed use under technical rules that will enable robust Wi-Fi deployments.”⁵

The Public Interest Organizations strongly support the NCTA and WISPA requests for an immediate FNPRM to consider what allocation of the 5.9 GHz band best serves the public

³ *Public Notice*, The Commission Seeks to Update and Refresh the Record in the “Unlicensed National Information Infrastructure (U-NII) Devices in The 5 GHz Band” Proceeding, ET Docket No. 13-49, 31 FCC Rcd 6130 (2016).

⁴ *Public Notice*, Office of Engineering and Technology Requests Comment on Phase I Testing of Prototype U-NII-4 Devices, ET Docket No. 13-49, DA 18-1111 (rel. Oct. 18, 2018).

⁵ Letter from Rick Chessen, NCTA, to Marlene H. Dortch, FCC Secretary, ET Docket No. 13-49, at 7 (filed Oct. 16, 2018) (“NCTA 2018 Letter”). *Accord* Letter from Claude Aiken, WISPA President & CEO, to Marlene H. Dortch, FCC Secretary, ET Docket No. 13-49 (filed Oct. 26, 2018) (“WISPA 2018 Letter”).

interest going forward. Notably, NCTA and WISPA could have used 5GAA's tactic and styled their filings as a "request for waiver," or as a "petition for rulemaking," but they accepted what the Commission should explain when it denies 5GAA's so-called "waiver" request: Labeling doesn't change the substance of the request. 5GAA is requesting an overhaul of the band's allocation and rules, which can and should be addressed in the broader context of a FNPRM in the ongoing 5.9 GHz proceeding.

5GAA tries to obscure the significance of its request by claiming that "its Waiver Request is narrowly tailored to allow for the immediate deployment of C-V2X during the pendency of the Commission's broader proceeding."⁶ This belies the details of its proposal. The permanent and exclusive authorization of a single technology (C-V2X) on a re-channelized, 20-megahertz segment of the band is anything but "narrowly tailored." 5GAA's proposal would completely reshape the Commission's broader proceeding and preempt outcomes under consideration. As noted above, the band segmentation proposal that remains pending as part of the 5.9 GHz proceeding could be rendered moot if 5GAA is granted the "waiver" it requests.

A FNPRM would also be more appropriate to address what appear to be mutually exclusive demands by the two auto industry factions. 5GAA is asking the Commission not just for a waiver enabling an additional ITS technology (C-V2X) in 5905-5925 MHz, but also for a total revocation of DSRC's authorization to operate on those frequencies. 5GAA's proposed conditions bluntly state: "DSRC operations will be prohibited from operating in these frequencies."⁷ Implicit in 5GAA's proposal to prohibit the use of DSRC in 5905-5925 MHz is that DSRC would operate, if at all, in a lower segment of the band and Wi-Fi would not be

⁶ 5GAA *Petition* at 2.

⁷ 5GAA *Petition*, "Appendix D – Proposed Conditions Applicable to C-V2X Operations Pursuant to the Waiver Request," at D-1.

considered for shared use. It's clear that 5GAA's request for an exclusive authorization would have a substantial impact on both DSRC and Wi-Fi users.

Moreover, although 5GAA's waiver request is limited to an initial, exclusive grant of a 20 MHz safety channel at the top of the band, the group clearly intends to seek additional channels across the rest of the band. 5GAA states:

[T]his request should not be misconstrued as an indication that C-V2X requires only 20 MHz of spectrum. While 20 MHz is the ideal channel size for 4G LTE-based C-V2X, i.e., the initial version of C-V2X, the bandwidth requirements to support more intensive 5G-enabled road safety applications will be much higher. . . . 5G technology requires access to large swaths of spectrum to meet the speed and latency requirements of 5G applications.⁸

In other words, 5GAA seems to suggest it would not make sense for the Commission to designate the 20 megahertz at 5905-5925 MHz for the exclusive use of "4G LTE-based C-V2X" unless the agency intends to later assign "large swaths" of additional spectrum to fuel the glide path to commercial 5G applications using C-V2X. This proposal and presumption necessarily impacts the entire band, the future of DSRC, and the potential for unlicensed access to the band. Far from being a "narrowly tailored" request, the 5GAA proposal would subsume and preempt the entirety of the Commission's ongoing proceeding. A decision with such a broad impact on all the parties contending for use of this band should be addressed in a Further Notice to the ongoing proceeding (ET Docket No. 13-49).

In short, 5GAA's petition falls far short of meeting the "good cause" test necessary for approval of the Petition.⁹ Even putting aside the petition's procedural defects, the technology is at such an early stage that an experimental license or other temporary authorization that

⁸ 5GAA Petition at 5.

⁹ *Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1164 (D.C. Cir. 1990); *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969).

facilitates real-world field testing could meet 5GAA's needs during the period the FCC needs to issue a FNPRM and decide on a complete, coherent realignment of the ITS band. The public interest clearly will not benefit from a narrow, near-term decision that this particular 20 megahertz is the prize in a beauty contest and should be awarded exclusively to the C-V2X faction of the auto industry without a broader consideration of alternative technologies (e.g., DSRC, automated vehicle and driver-assist), alternative uses (e.g., unlicensed sharing), and alternative bands for V2X that are potentially *more* useful for a system that is an application integrated with future 5G mobile networks.

III. 5GAA's Request for a Technology Mandate in the Upper 5.9 GHz Band is Contrary to the Public Interest and to FCC Principles of Modern Spectrum Management

The rationale that 5GAA offers for its effort to obtain Commission permission to deploy C-V2X technology as an alternative to DSRC is certainly correct: "The Commission's current rules for the 5.9 GHz band – adopted well before the development of C-V2X – restrict ITS operations to those that use the DSRC standard."¹⁰ However, repeating the mistake of assigning exclusive spectrum to a specific technology or standard on the basis of a FCC beauty contest is not the solution that best serves the public interest. Even if there are compelling reasons to segment the band to create one or more exclusive channels for real-time auto safety signaling, that should be decided in the context of a broader, fresh-look FNPRM that considers alternative uses in all or a portion of the band, including for shared unlicensed access.¹¹

It should not matter, as 5GAA opines, that "C-V2X peer-to-peer mode consistently outperforms DSRC in several key areas." 5GAA is effectively asking the Commission to decide

¹⁰ 5GAA *Petition* at 4.

¹¹ See, e.g., NCTA October Ex Parte; WISPA Ex Parte.

that its technology is superior to DSRC and to trust – as the Commission trusted a similar auto industry coalition 20 years ago – that its grand vision of seamlessly connected everything (cars, pedestrians, bicycles, competing mobile carrier networks, and traffic control infrastructure across thousands of local jurisdictions) will both find adequate funding and be so much better than any technologically-neutral and market-driven outcome. Unless DOT has decided it will propose to mandate a dedicated C-V2X radio in every vehicle, the FCC should not declare any technology or standard the winner of a technological beauty contest. At best, 5GAA’s proposal would implicitly divide the band between the two competing technologies without so much as a suggestion about how the two will communicate well enough to ensure that in 15 years (the time it takes for the U.S. vehicle fleet to turn over) the nation will actually achieve interoperable and reliable real-time safety signaling.

Commission spectrum policy has evolved over the past two decades in a direction that is distinctly incompatible with 5GAA’s proposal. The Commission should continue to move away from silos of special-purpose spectrum bands and toward more intensively-used and flexible general-purpose use of spectrum. C-V2X has a perfect opportunity to prevail in the market as an application on general purpose mobile 5G networks. And even if the Commission decides that a spectrum set-aside for time-critical safety signaling is justified, the band segmentation approach that has been before the agency for three years at least minimizes the cost of another DSRC-type failure. As both the FCC’s 2002 Spectrum Policy Task Force and the FCC’s 2010 National Broadband Plan emphasized, exceptions made for public safety or other public interest allocations should be narrowly defined *“and the amount of spectrum . . . limited to that which ensures that those [compelling public interest] objectives are achieved.”*¹²

¹² *Report of the Spectrum Policy Task Force*, ET Docket No. 02-135, at 41 (Nov. 2002), available at http://sites.nationalacademies.org/cs/groups/bpasite/documents/webpage/bpa_048826.pdf.

Assigning portions of the 5.9 GHz band exclusively to any technology or industry group is clearly problematic. Neither faction of the auto industry (DSRC or C-V2X) acquired licenses by auction. And absent a DOT safety mandate neither faction has any incentive other than to spin promises of voluntary V2X deployments for safety into the free use of 75 megahertz for mostly commercial services (infotainment, mobile payments, in-car display advertising, etc.). And even if one or both eventually deploy effective safety signaling, an industry-specific allocation that risks leaving most of the band's capacity essentially fallow for the indefinite future is distinctly inconsistent with FCC spectrum management principles adopted in the years since the original 1999 ITS allocation.

The admonition in the 2012 report and recommendations of the President's Council of Advisors on Science and Technology (PCAST) is as relevant for the 5.9 GHz band as it is for sharing underutilized Navy radar spectrum at 3.5 GHz:

The incongruity between concern about a 'looming spectrum crisis' and the reality that only a fraction of the Nation's prime spectrum capacity is actually in use suggests the need for a new policy framework to unlock fallow bandwidth in all bands, as long as it can be done without compromising the missions of Federal users¹³

As Julius Knapp, chief of the FCC's Office of Engineering and Technology, stated back in 2014: "The days of service-specific spectrum allocations are over – the Commission's flexible rules in both unlicensed and licensed bands obviate the need for allocations narrowly tailored to specific uses."¹⁴ Until the late 1990s, the FCC authorized exclusive allocations to accommodate

¹³ The President's Council of Advisors on Science and Technology (PCAST), "Realizing the Full Potential of Government-Held Spectrum to Spur Economic Growth" (July 20, 2012), *supra* note 28, at 16, https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/pcast_spectrum_report_final_july_20_2012.pdf.

¹⁴ Alton Burton Jr., "Winnik Forum: U.S. Federal Communications Commission's chief engineer explains that flexible use spectrum policy will readily accommodate the Internet of Things," Hogan Lovells Blog (Nov. 18, 2014), *available at* <http://www.lexology.com/library/detail.aspx?g=0b64c821-c219-4d0d-8229-8b4a887dc7f7>.

specific technologies and business models with restrictive service and technical rules. This “command-and-control” approach became increasingly subject to criticism by advocates of both flexible licensing and unlicensed use. Narrow, highly-specified allocations can rapidly become obsolete or spectrally inefficient, since “[a]ny narrow allocation locks in a particular technology or spectrum use” long after “it has been surpassed by an existing service or technology . . . or by an entirely new service or technology.”¹⁵

DSRC is a prime example. In its original 1999 *Order* allocating 75 megahertz to ITS, the Commission described a future of autonomous vehicles that, like trains on a track, “would transfer full control of equipped vehicles to an automated system operating on designated AHS [Automated Highway System] lanes.”¹⁶ This not only suggests a cloudy crystal ball, but also that *even if* the Commission could correctly identify the most productive use of spectrum at any given time, it would be obliged continually to modify single-purpose allocations to reflect technological and economic developments.¹⁷

Just weeks after the Commission adopted its 1999 *Order* allocating 75 megahertz for ITS, the agency adopted new policy principles for spectrum allocation, affirming that “[f]lexible allocations may result in more efficient spectrum markets,” while noting that exceptions could be

¹⁵ Covington & Burling, *Prospects for U.S. Spectrum Management*, at 4 (June 2002). “Narrow allocations are likely to be suboptimal: Any system that demands *ex ante* evaluation of competing technologies and their public benefits involves some risk of error, even by an expert agency.” *Id.*

¹⁶ “This vision of safe, autonomous vehicles was correct, except for the fact that the driverless cars being tested on the U.S. roads today neither need nor use DSRC communications, whether V2V or V2I.” 1999 Reallocation Order, at p. 5.

¹⁷ *Id.* at p. 92; *see also* Covington & Burling Report, *supra* note 156, at p. 4: “As the pace of technological change increases, suboptimal allocations are likely to become obsolete even faster just as spectrum is urgently needed for new services.”

made for public safety and certain other services “where market forces would fail to provide for the operation of important services.”¹⁸

Three years later, the FCC’s Spectrum Policy Task Force Report went further, recommending that the Commission “eschew command-and-control regulation” of spectrum use and transition “legacy command-and-control bands to more flexible rules.”¹⁹ Like the Commission’s 1999 *Spectrum Allocation Principles*, the Task Force noted that the agency should continue to make exceptions only in cases “where prescribing spectrum use by regulation is necessary to accomplish compelling public interest objectives,” or to conform to treaty obligations.²⁰ The Task Force Report emphasized that exceptions made for public safety or other public interest allocations should be narrowly defined “*and the amount of spectrum . . . limited to that which ensures that those [compelling public interest] objectives are achieved.*”²¹ The Task Force went on to warn that since many spectrum users will claim their planned use deserves an “exemption from any reform of their service allocation rules,” it is “critical to distinguish between special interests and the public interest, establishing a high bar for any service to clear prior to receiving an exemption.”²²

With respect to allocations not strictly necessary for compelling non-market purposes, such as safety-of-life, the Task Force recommended that “existing spectrum that is subject to command- and-control regulation should be transitioned to the more flexible exclusive use and

¹⁸ See Policy Statement, *Principles for Reallocation of Spectrum to Encourage the Development of Telecommunications Technologies for the New Millennium*, 14 FCC Rcd 19868, 19870 (rel. Nov. 22, 1999) (“1999 Reallocation Principles”), at ¶¶ 9, 11, available at https://transition.fcc.gov/Bureaus/Engineering_Technology/Orders/1999/fcc99354.txt.

¹⁹ *Report of the Spectrum Policy Task Force*, ET Docket No. 02-135 (Nov. 2002), available at http://sites.nationalacademies.org/cs/groups/bpasite/documents/webpage/bpa_048826.pdf (“Task Force Report”).

²⁰ *Id.* at 41.

²¹ *Id.* See also FCC, “Report of the Spectrum Efficiency Working Group,” Spectrum Policy Task Force (2002), at p. 34-36, available at https://transition.fcc.gov/sptf/files/SEWGFfinalReport_1.pdf.

²² *Id.*

commons models to the greatest extent possible.”²³ The Report further recommended that the “Commission should, where feasible, seek to designate additional bands for unlicensed spectrum use to better optimize spectrum access and provide room for expansion in the fast-growing market for unlicensed devices and networks.”²⁴

Eight years later, in its 2010 National Broadband Plan, the Commission reinforced its rejection of the old approach to allocating spectrum “on a band-by-band, service-by-service basis, typically in response to specific requests.”²⁵ The National Broadband Plan states that this approach “has been criticized for being ad hoc, overly prescriptive and unresponsive to changing market needs.”²⁶ The Plan goes on to assert that “flexibility in access to spectrum can be just as important” as flexibility in spectrum use, and should increasingly include “unlicensed uses, shared uses and opportunistic uses.”²⁷ The Plan further concludes that “the failure to revisit historical allocations can leave spectrum handcuffed to particular use cases and outmoded services, and less valuable and less transferable to innovators who seek to use it for new services.”²⁸

General Purpose vs. Special Purpose Allocations

The fact that most of the non-safety-of-life applications originally proposed for DSRC have become available using more general-purpose technologies and networks – most commonly smartphone apps, such as Waze, using LTE and Wi-Fi connectivity – is a familiar outcome for narrow, special-purpose allocations. The need to reallocate or reorganize valuable spectrum

²³ *Id.* at p. 6.

²⁴ *Id.* at p. 6.

²⁵ Federal Communications Commission, “Chapter 5: Spectrum,” *National Broadband Plan: Connecting America*, (2010), at p. 75, available at <http://download.broadband.gov/plan/national-broadband-plan.pdf>.

²⁶ *Id.*

²⁷ *Id.*

²⁸ *Id.*

occupied by special-purpose services that have become outdated or replaced by general-purpose networks is an ongoing challenge for the FCC. An example includes large allocations for “wireless cable” (the former Instructional Television Fixed Service and former Multichannel Multipoint Distribution Service) in the 2.5 GHz band, which has been functionally replaced by high-capacity wireline connections and by the cellular/LTE networks that now lease most of the reorganized band. And yet the inefficiencies and fallow spectrum associated with these special-purpose spectrum grants continue to this day.

The Commission has repeatedly recognized the benefits of migrating from special-purpose to general-purpose networks and allocations. For example, in its 2014 NPRM on wireless microphones, the Commission observed that “the past several decades have seen widespread development and deployment of ‘general purpose’ wireless technology standards that may be used for a wide variety of end-user applications,” including the IEEE 802.11 family of standards, and asks whether these technologies could allow wireless mics to operate on a shared basis in one or more of the unlicensed bands.²⁹

The Commission’s longtime effort to move away from silos of special-purpose use and toward more intensively-used and flexible general-purpose use also reflects a critical distinction between real-time safety and non-safety applications critical. Real-time V2V and V2I communication for crash avoidance (whether via C-V2X or DSRC) will necessarily occupy a single designated safety channel of 10 or at most 20 megahertz. The remainder of the 75 megahertz allocation for DSRC has always been anticipated to provide multiple channels for a wide variety of non-time-critical safety applications and commercial services, most of which are

²⁹ Federal Communications Commission, 79 Fed. Reg. 69, 387 (proposed Nov. 21, 2014) (GN Docket Nos. 14–166 and 12–268; FCC 14–145) (to be codified at 47 C. F. R. pt. 74) (“Spectrum Access for Wireless Microphone Operations NPRM”).

either already or could be provided most efficiently over existing general purpose LTE, 5G and/or Wi-Fi networks.

Tellingly, ITS America argued 20 years ago, much as 5GAA and DSRC advocates do now, that a 75 megahertz cost-free allocation was needed to implement the industry’s vision of 11 or more categories of “user services” (such as navigation assistance, driver notifications, traffic monitoring) that would require additional channels. The FCC relied on auto industry claims that this “wide array of DSRC applications” would need capacity for “up to 32 different DSRC transactions, many of which will require two-way capabilities, wideband channels, and the need for multiple channels in a single location.”³⁰

Of course, the reality proved to be very different, as it typically is when it comes to claims of amazing public interest benefits from a special-purpose spectrum giveaway. Every one of the 11 categories of DSRC “user services” (applications) cited by the FCC as the rationale for a special-purpose allocation – current, emerging and future applications – today either have proven general-purpose substitutes or depend on the widespread deployment of dense roadside infrastructure by localities nationwide that is widely acknowledged to be unlikely in the foreseeable future (and less so as private spending on driver-assist technology and, ultimately, autonomous vehicles supplant the need for massive public spending).

IV. A FNPRM Should Take a Fresh Look at the Reallocation of the Entire 75 MHz with Respect to Unlicensed and Auto Safety Signaling

The highest and best use of the 5.9 GHz band must be reconsidered. For 20 years the 5.9 GHz band has remained virtually unused while the public’s use of and need for more unlicensed mid-band spectrum for fast and affordable broadband connectivity has surged. OTI agrees with

³⁰ See 1999 Reallocation Order at p. 5-6, citing ITS America study.

NCTA, WISPA and other parties that “the country can no longer afford to hold 75 megahertz of optimal spectrum in reserve with the hope that the next twenty years will somehow be different than the last two decades of stagnation.”³¹

As Commissioner O’Rielly stated recently, “if DSRC no longer makes sense, the Commission could combine the 5.9 and 6 GHz bands to expand current unlicensed operations and promote continued growth.”³² Commissioner Rosenworcel recently highlighted that the United States is unique in allocating so much spectrum to V2X, and that it is hindering our wireless future. “[W]e need to support automobile safety. However, our spectrum policies supporting safety need to be current. So we should speed the way for our thinking about DSRC to be up to date. . . . let’s acknowledge that other countries are doing this using less spectrum than the 75 megahertz that the United States has set aside.”³³

In its Europe-based advocacy, 5GAA itself has acknowledged the ability of the two V2X technologies to both achieve V2V safety signaling and coexist within a 30 megahertz allocation (5875-5905 MHz), initially relying on exclusive 10 MHz channels, and later sharing the total of 30 MHz the EU has allocated for V2X safety. The group’s 2018 whitepaper touts the ability of ITS-G5 (the 802.11-based equivalent of DSRC) and Cellular-V2X to eventually share the entire 30 MHz the EU has decided to allocate using detect-and-avoid. 5GAA proposed “a spectrum sharing solution based on technology detection and dynamic frequency/channel selection – to be

³¹ See Letter from Rick Chessen, NCTA, to Marlene H. Dortch, FCC Secretary, ET Docket No. 13-49, at 1 (Oct. 16, 2018); Letter from Claude Aiken, WISPA, to Marlene H. Dortch, FCC Secretary, ET Docket No. 13-49, at 1 (Oct. 26, 2018).

³² Remarks of FCC Commissioner Michael O’Rielly before the 6th Annual Americas Spectrum Management Conference, at 5 (Oct. 13, 2017), https://apps.fcc.gov/edocs_public/attachmatch/DOC-347222A1.pdf.

³³ Remarks of FCC Commissioner Jessica Rosenworcel, Silicon Flatirons Conference (Sep. 6, 2018), <https://docs.fcc.gov/public/attachments/DOC-353982A1.pdf>.

agreed among the stakeholders – to be implemented in up to three steps.”³⁴ 5GAA described a two-step evolution to band sharing:

“In all steps, each of C-V2X and ITS-G5 can operate safety-related ITS services free from co-channel interference from the other technology. The difference between the distinct steps lies in the overall usage of the spectrum resource: **In the short-term first step, we propose to specify preferred 10 MHz channels at 5875- 5905 MHz to each of the two technologies, while in the longer term third step, the solution will allow full sharing of all available channels [30 MHz] by the two technologies.** The latter will require further studies on appropriate sharing mechanisms and thus cannot be provided from the beginning.”³⁵

Because the 5.9 GHz band is virtually vacant today, both a band reallocation and a band-segmentation approach would allow the FCC to combine the U-NII-3 and U-NII-4 bands to provide the country with at least one additional, contiguous 160-megahertz channel free from the sort of coexistence mechanisms that hinder rural broadband deployments (such as dynamic frequency selection or low power restrictions). This would greatly amplify the benefits of the Commission’s pending proposal to extend unlicensed access into the adjacent 6 GHz band above. In the context of today’s broadband needs, the vacant 5.9 GHz band is a roadblock in a potential spectrum superhighway for gigabit-fast Wi-Fi and rural fixed wireless access. As Commissioner O’Rielly so aptly put it, the 5.9 GHz band is “the missing link between the 5 GHz and 6 GHz bands.”³⁶

Freeing up a relatively clean and contiguous 160 MHz for unlicensed use both outdoors and indoors would be the rare spectrum policy change that could immediately address the needs of both urban and rural communities. While more densely populated areas typically enjoy high-speed fixed broadband, residents need more Wi-Fi capacity at home, at work and in congested

³⁴ 5GAA, “Coexistence of C-V2X and ITS-G5 at 5.9 GHz” (April 5, 2018) at 1, <http://5gaa.org/wp-content/uploads/2018/10/Position-Paper-ITG5.pdf> (emphasis added).

³⁵ *Ibid.*

³⁶ Statement of Commissioner Michael O’Rielly, ET Docket No. 18-295, GN Docket No. 17-183 (Oct. 23, 2018).

areas, from shopping districts to sporting arenas. Conversely, many millions of rural and small town residents lack high-capacity broadband at home – and even a single contiguous block of 160 MHz across U-NII-3 and U-NII-4 gives local ISPs the means to shrink the rural access and affordability divide. Our groups strongly agree with Commissioner Rosenworcel’s observation that with autonomous and connected vehicles adopting different, market driven technologies for auto safety, “[i]t is time to take a fresh look at this band to allow a broader range of uses.”³⁷

The PIOs generally agree with NCTA and WISPA that the Commission should adopt a FNPRM that:

1. Recognizes that past command-and-control, over-regulatory efforts to mandate a particular technology or to reserve the band for particular companies have failed;
2. Finds that substantial changes in the 5 GHz spectrum environment, the market’s rejection of DSRC, the pressing need for additional unlicensed spectrum, and the congressional mandate to identify new unlicensed resources all support a proposal to designate all or a substantial portion of the 5.9 GHz band for unlicensed use under technical rules that will enable robust Wi-Fi deployments; and
3. Seeks comment on whether to allocate other, more suitable spectrum for automotive communications technologies.³⁸

A. The Vacant 5.9 GHz Band is Needed to Facilitate Gigabit-Fast Wi-Fi as an Essential Part of a More Accessible and Affordable 5G Wireless Ecosystem

The opportunity to combine U-NII-3, the 5.9 GHz and the 6 GHz band above 5925 MHz to amplify the enormous benefits of Wi-Fi in the nation’s future 5G wireless ecosystem is reflected by the key role Wi-Fi plays today. The mobile device data traffic transported over Wi-

³⁷ Statement of Commissioner Jessica Rosenworcel on the 5.9 GHz Band (rel. Oct. 16, 2018), <https://docs.fcc.gov/public/attachments/DOC-354588A1.pdf>. Commissioner O’Rielly agreed, saying in his statement that “is pure folly to believe that DSRC will ever work as envisioned” and “the Commission should quickly reexamine the 5.9 GHz band for repurposing.” Statement of Commissioner Michael O’Rielly on NCTA 5.9 GHz Letter (rel. Oct 16, 2018), <https://docs.fcc.gov/public/attachments/DOC-354589A1.pdf>.

³⁸ NCTA 2018 Letter at 7.

Fi networks – rather than over mobile carrier networks – is increasing roughly 40 percent each year and vastly exceeds all other wireless technologies, making more spectrum capacity for Wi-Fi critical. Unlicensed spectrum currently available in the 2.4 GHz and 5 GHz unlicensed bands “carry more internet data than any other wireless technology or service, with usage expected to continue increasing at a rapid pace.”³⁹ Cisco’s ongoing Visual Networking Index forecasts continued year-over-year growth of 30 percent in overall internet data traffic, with nearly 80 percent of all internet traffic flowing over mobile (22 percent) or Wi-Fi networks (57 percent) by 2022.⁴⁰ Globally, Cisco projects there will be nearly 549 million public Wi-Fi hotspots by 2022, up from 124 million hotspots in 2017, a fourfold increase.⁴¹ The reliance of smartphone, tablet and even laptop users on Wi-Fi to ensure fast, affordable and ubiquitous mobile connectivity has been found in other reports as well.⁴² As high-definition video and other high-bandwidth

³⁹ Comments of All Points Broadband, Amplex Internet, Apple, Blaze Broadband, Broadcom, Cambium Networks, Cisco Systems, Cypress Semiconductor, Dell, Extreme Networks, Facebook, Fire2Wire, Google, Hewlett-Packard Enterprise, HP, Intel, Joink, MediaTek, Metalink Technologies, Microsoft, New Wave Net, Pixius Communications, Qualcomm, Rise Broadband, Ruckus, Snappy Internet, Sony Electronics, Western Broadband, Wireless Internet Service Provider Association, and Wisper ISP, GN Docket No. 17-183, at 5 (Oct. 2, 2017), citing the Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2016– 2021, 21–22 & fig. 23 (2017), <https://www.cisco.com/c/en/us/solutions/collateral/serviceprovider/visual-networking-index-vni/mobilewhite-paper-c11-520862.pdf>.

⁴⁰ Cisco, *Cisco Visual Networking Index: Forecast and Trends, 2017– 2022*, White Paper, at 23 & fig. 22 (updated Nov. 26, 2018) (“*Cisco VNI*”), available at <https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white-paper-c11-741490.html>. Mobile device traffic was expected to reach 6.9 GB per month per active smartphone in North America by the end of 2017. See *Ericsson Mobility Report* (June 2017), at 14, available at <https://www.ericsson.com/assets/local/mobility-report/documents/2017/ericsson-mobility-reportjune-2017.pdf>.

⁴¹ *Cisco VNI*, *supra*, at 21. Cisco reports that Western Europe had the highest number of hotspots, with 48 percent of the world’s Wi-Fi hotspots in 2017, but that Asia is likely to have the highest number (47 percent) by 2022. “Critical enablers of Hotspot 2.0 adoption are higher speed Wi-Fi gateways and the adoption of the IEEE 802.11ac and the latest 802.11ax standards.” *Ibid*.

⁴² *Global State of Mobile Networks*, Open Signal (February 2017), available at <https://opensignal.com/reports/2017/02/global-state-of-the-mobile-network>. “In general though, we see a high proportion of time spent on Wifi in the majority of the 96 countries we analyzed. Specifically, 38 of those countries had time on Wifi scores of 50% or greater, meaning in a large part of the world our users are spending as much time connected to Wifi networks as they are cellular networks. Rather than acting

applications proliferate, the ability of Wi-Fi to offload traffic from mobile networks to nearby fixed networks via unlicensed spectrum will become increasingly important.

Like electricity, wireless connectivity is a critical input to most other economic activity and rapidly becoming even more pervasive. As a result, industry studies project daunting deficits in the availability of both licensed and unlicensed spectrum. A study commissioned by the Wi-Fi Alliance projects a shortfall of between 500 MHz and 1 GHz of unlicensed spectrum by 2025.⁴³ A separate study by Qualcomm reached a similar conclusion, finding that “regulators should plan for around 1280 MHz of unlicensed spectrum centered around the 5 GHz band for use by unlicensed technologies.”⁴⁴

Wi-Fi and other unlicensed technologies make high-capacity internet access more affordable for all Americans and represent a rapidly growing component of the economic value of wireless communications. A recent report found that: “The current economic surplus of unlicensed spectrum in the U.S. from a selected set of applications amounts to, at least, \$496.13 billion today, while also contributing \$29.06 billion to the nation’s GDP.”⁴⁵ That same report, by Dr. Raul Katz, Director of Business Strategy Research at Columbia University’s Center for Tele-Information, found that Wi-Fi cellular offloading generated \$25.2 billion in value to the U.S. economy in 2017 *alone*.⁴⁶ The report sheds light on how essential Wi-Fi is for mobile carriers as well, which rely on fixed networks and Wi-Fi in particular for the majority of bandwidth

as a mere supplement to 4G networks, Wifi remains as important a technology as any cellular system in mobile communications.” *Ibid*.

⁴³ Steve Methley & William Webb, Quotient Assocs. Ltd., *Wi-Fi Spectrum Needs Study*, at 29 (Feb. 2017) (“[B]etween 500 MHz and 1 GHz of new spectrum will be needed in 2025 to satisfy the anticipated busy hour.”), available at <https://bit.ly/2NSC7YL>.

⁴⁴ Rolf de Vegt et al., Qualcomm Techs., Inc., *A Quantification of 5 GHz Unlicensed Band Spectrum Needs* 5 (2017).

⁴⁵ “NEW REPORT: Economic Value of Unlicensed Spectrum in the U.S. Tops \$525 Billion,” Wi-Fi Forward, (May 17, 2018), <http://wififorward.org/2018/05/17/new-report-economic-value-of-unlicensed-spectrum-in-the-u-s-tops-525-billion/>.

⁴⁶ *Ibid*.

consumed by mobile devices, especially indoors. In addition, unlicensed spectrum is serving as the primary connective tissue for machine-to-machine data transfer and the emerging Internet of Things. Energy monitoring, environmental monitoring and controls, mobile healthcare monitoring, industrial automation, intelligent transportation networks, control systems (for agricultural machinery, toll booths, traffic lights) are seeing rapid growth with declining costs to consumers.⁴⁷

Unlicensed access to all or a substantial portion of the 5.9 GHz band will be particularly important to the emerging 5G wireless ecosystem. Sandwiched between what are likely to be the two primary bands for next generation Wi-Fi, the 5.9 GHz band is uniquely tailored to unlicensed use, particularly the next generation, gigabit-fast Wi-Fi characterized by the new IEEE 802.11ax standard. With more and more users demanding increasingly high-bandwidth and real-time applications, such as interactive high-definition video calling and streaming, the 20 megahertz wide channels that characterize today's Wi-Fi do not offer enough capacity to accommodate the projected increases in demand, including the demand for interactive, real-time applications such as video calling. Wider channels will be critical to fuel very high-bandwidth apps and pervasive connectivity. This is particularly true in the enterprise environment, and in user-dense venues such as schools, hotels, retail malls and sporting events where the aggregate demand for bandwidth and low-latency will outstrip current Wi-Fi capabilities.

As Wi-Fi transports an increasing majority of the nation's mushrooming mobile data traffic, Americans will need both more unlicensed spectrum *and* the wider channels necessary to handle higher-bandwidth applications and higher-density demand. The FCC recognized this in its

⁴⁷ See Richard Thanki, *The Economic Significance of License-Exempt Spectrum to the Future of the Internet* (June 2012), at p. 65.

5 GHz NPRM, stating that “[t]he deployment of wide channel bandwidths with higher data rates in the 5 GHz band can help meet the challenge that rapid growth in demand has posed for the wireless industry”⁴⁸

Today’s principal Wi-Fi band, at 2.4 GHz, provides only three non-overlapping 20 megahertz channels and a maximum data rate of 130-150 Mbps. Wi-Fi using 802.11ac is designed specifically to operate on the wider, contiguous channels available only in the 5 GHz band and capable of gigabit-fast throughput. And on the immediate horizon is the potential multi-gigabit capacity of the IEEE 802.11ax standard, recently branded as Wi-Fi 6. Contiguous channels of up to 160 megahertz are needed to realize the full potential of equipment employing these next generation Wi-Fi standards.

If the FCC adopts its proposal to harmonize the rules for unlicensed use across the U-NII-3 and new U-NII-4 spectrum (5.725-5.925 GHz), this would allow devices to access 200 megahertz of contiguous spectrum that is fully useful for commercial indoor and outdoor gigabit Wi-Fi. It would also provide a currently missing piece of the FCC’s 2013 proposal to expand the availability of unlicensed spectrum for low-power unlicensed use in the 5 GHz band to a total 750 megahertz.⁴⁹ In short, opening large contiguous tracts of spectrum in the 5 GHz band for unlicensed sharing is key to creating the “wider pipe” required for gigabit Wi-Fi networks.

⁴⁸ Federal Communications Commission, *In the Matter of Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, ET Docket No. 13-49 (rel. Feb. 20, 2013) (“5 GHz FNPRM”), at ¶ 80.

⁴⁹ In 1997 the FCC made available 300 megahertz of spectrum at 5.15-5.25 GHz (the U-NII-1 band), 5.25-5.35 GHz (U-NII-2A), and 5.725-5.825 GHz (U-NII-3) for use by a new category of unlicensed equipment, U-NII devices, which are regulated under Part 15, Subpart E of the Commission’s rules. In 2003 the agency made an additional 255 megahertz of spectrum available in the 5.47-5.725 GHz (U-NII-2C) for U-NII devices. In the 2013 NPRM that is the subject of this paper, the FCC proposed adding an additional 195 megahertz, the uppermost portion of which (a new U-NII-4 band) to include unlicensed sharing of the 75 megahertz ITS band. *See* 5 GHz FNPRM at ¶ 4.

It is also critical to realize that the public interest in more mid-band unlicensed spectrum extends beyond Wi-Fi and includes, in particular, the urgent need to address the rural digital divide. Both the Public Interest Spectrum Coalition (“PISC”) and the Broadband Connects America coalition described extensively in recent comments (filed in response to the Commission’s C-band NPRM) the fact that rural, tribal and small town America lacks access to high-speed broadband at much higher rates than their counterparts in urban and suburban areas.⁵⁰ This lack of access contributes to a growing gap between the vibrancy of local economies in rural areas compared to urban and suburban areas. Studies show both people and economic activity is moving out of rural areas lacking high-speed and affordable broadband.

Even in rural areas where high-speed broadband has been deployed, consumers are less likely to have a choice among competing providers and generally are more likely to pay more money for worse service. A major obstacle is the cost of deployment, as fiber and other wireline technologies can be five-to-seven times or more costly and far slower to deploy in less densely-populated or topographically-challenging areas. More mid-band spectrum for point-to-multipoint (P2MP) fixed wireless, on the other hand, can serve as the public infrastructure that enables high-speed broadband in targeted, hard-to-reach rural areas at a fraction of the cost of fiber and other wireline technologies.

In this respect we strongly agree with WISPA that the potential extension of the U-NII-3 band and thereby more contiguous unlicensed spectrum for point-to-multipoint fixed wireless deployments can greatly benefit rural, small town and other underserved communities. As WISPA stated in support of a broad “fresh look” FNPRM:

⁵⁰ Comments of the Public Interest Spectrum Coalition, *Expanding Flexible Use of the 3.7 to 4.2 GHz Band, Order and Notice of Proposed Rulemaking*, GN Docket Nos. 18-122 and 17-183, at 8-11, at 5-12 (filed Oct. 29, 2018); Broadband Access Coalition Comments, GN Docket Nos. 18-122 and 17-183, at 8-11 (filed Oct. 29, 2018).

[T]he availability of up to 75 megahertz of spectrum immediately adjacent to the 5 GHz U-NII band and the 6 GHz band where unlicensed use is contemplated will be extremely useful for higher-EIRP rural fixed wireless broadband deployments. WISPA's members have made extensive and intensive use of the 5 GHz band, which is used to serve millions of consumers that lack other alternatives to terrestrial broadband in their homes, farms, and businesses. Equipment can be easily adapted to operate in the 5.9 GHz band and quickly deployed.⁵¹

B. The Absence of a DSRC Mandate is an Opportunity to Reallocate V2X Safety Signaling to a Band that Better Supports Integration with General Purpose 5G Mobile Networks

Even if the Commission is inclined to agree that the public interest is served by reserving one or more channels for real-time V2X safety-signaling systems, it should do so within the context of a FNPRM in its ongoing 5 GHz proceeding (ET Docket No. 13-49) that considers not only alternative allocations within the 5.9 GHz band, but also whether safety-related V2X operations should be deployed in a different band. OTI strongly agrees with NCTA that because of the growth of unlicensed operations in U-NII-3 and the Commission's proposal to authorize unlicensed operations at immediately above 5925 MHz, "if engineers were starting today with a clean slate and looking for a home for automotive operations, they would never choose the 5.9 GHz band." Because the auto industry has left the band fallow for 20 years, "the FCC is, in fact, starting with an essentially clean slate."

Given 5GAA's ultimate objectives, which extend far beyond a 20 megahertz channel for real-time safety signaling, the Commission should consider whether the emergence of cellular car connectivity as one or more applications on mobile carrier 5G networks offers an opportunity to relocate V2X to spectrum that is not sandwiched between Wi-Fi bands and that is potentially better integrated with general purpose carrier networks. 5GAA states that although "the initial

⁵¹ Letter from Claude Aiken, WISPA, to Marlene H. Dortch, FCC Secretary, ET Docket No. 13-49, at 1 (Oct. 26, 2018).

3GPP standards specify a 4G LTE-based version of C-V2X,” the standard “is designed with a clear path to 5G,”⁵² including a Vehicle to Network (V2N) mode that will “extend[] the number of use cases for C-V2X” and “enable other important public interest benefits, including improvements in traffic efficiency, productivity, mobility, and the conservation of fossil fuels.”⁵³ 5GAA states that C-V2X functionality can also be more economic than DSRC because “virtually all new vehicles are or soon will be equipped with cellular modem chipsets,” and “C-V2X can be added as an additional feature in these chipset products.”⁵⁴

Finally, our groups acknowledge that the petition does reflect a growing consensus that the DSRC mandate was ill-advised and, without a DOT mandate, DSRC will fade away. Requiring DSRC in the band would be counter-productive through a restrictive technology-specific mandate, take years to implement, and would cost billions of dollars. The National Highway Traffic Safety Administration estimated that mandating DSRC would cost \$5 billion annually, and that total costs would reach \$108 billion by the year 2060.⁵⁵ Other reports from the Brattle Group and the Government Accountability Office reflect the costliness of a DSRC mandate.⁵⁶ As Mercatus Center’s Brent Skorup notes, “The DOT acknowledges that ‘estimating the potential costs and benefits of V2V [is] quite difficult’ because V2V ‘improve[s] safety only

⁵² 5GAA *Petition* at 16.

⁵³ *Id.* at ii, 16.

⁵⁴ *Id.* at 19.

⁵⁵ National Highway Traffic Safety Administration (NHTSA), Department of Transportation (DOT) NPRM, Docket No. NHTSA-2016-0126 (Jan. 12, 2017), at 4000, <https://www.federalregister.gov/documents/2017/01/12/2016-31059/federal-motor-vehicle-safety-standards-v2v-communications>; Letter of Competitive Enterprise Institute, American Commitment, Niskanen Center, Reason Foundation, and R St. Institute to Transportation Secretary Elaine Chao (April 3, 2017), <https://cei.org/sites/default/files/Letter%20to%20USDOT%20on%20V2V%20April032017.pdf>.

⁵⁶ The Brattle Group, “The Economic Costs and Benefits of a Federal Mandate that All Light Vehicles Employ 5.9 GHz DSRC Technology” (May 2, 2016), http://files.brattle.com/system/publications/pdfs/000/005/284/original/brattle_costs_benefits_of_v2v_mandate_may_2_2016.pdf; Government Accountability Office, “Vehicle-to-Infrastructure Technologies Expected to Offer Benefits, but Deployment Challenges Exist” (Sep. 2015), <https://www.gao.gov/assets/680/672548.pdf>.

indirectly.’ The indirect safety benefits, plus the long timeline before net benefits arise [15 to 30 years], plus the unreasonably optimistic predictions of market-ready units should counsel caution. The agency’s estimate that cumulative benefits will match cumulative costs in 2030 should be viewed skeptically.”⁵⁷ In retrospect, both the FCC’s technology-specific mandate of DSRC and DOT’s proposed mandate are widely seen as overly restrictive, ineffective, and spectrally inefficient. By seeking to replace DSRC as the winner of another technology and spectrum beauty contest, 5GAA’s waiver petition is as substantively misguided as it is procedurally infirm. Our groups urge the Commission to instead optimize the public interest in both real-time vehicle safety signaling and in next generation unlicensed technologies by expeditiously adopting a FNPRM that rethinks the use of the entire 5.9 GHz band.

IV. Conclusion

The Commission should deny 5GAA’s waiver request and expeditiously adopt a Further Notice of Proposed Rulemaking to reconsider the highest and best use of the 5.9 GHz band as a whole. By completing its ongoing 5 GHz rulemaking, the Commission can also consider the issues raised by 5GAA. The Commission’s preliminary tests have confirmed what public interest advocates and the tech industry have posited for years—that the 5.9 GHz band is perfectly situated to help extend the contiguous unlicensed spectrum available so that next generation Wi-Fi can serve as a crucial element in a world-leading and affordable 5G wireless ecosystem.

/s/ Michael Calabrese

Amir Nasr

Wireless Future Project

Open Technology Institute at New America

740 15th Street NW, Suite 900

Washington, D.C. 20005

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⁵⁷ Brent Skorup, “The Department of Transportation’s Proposed Vehicle-to-Vehicle Technology Mandate Is Unprecedented and Hasty,” Mercatus Center Blog (April 14, 2017), <https://www.mercatus.org/publications/departments-transportation-v2v-technology-mandate>.